BatteryMINDer® Model 28252-AA-S3/S4
(With Desulfation)

INSTRUCTION MANUAL

28-Volt @ 25 Amp
Avionic Power Supply / Charger - Desulfator

AVIATION-CALIBRATED 24-V AIRCRAFT BATTERIES ONLY

FOR LEAD-ACID (Sealed or Wet Cell) GA BATTERY ONLY

Model 25252-AA-S3: ONLY FOR USE with GILL LT Series, ODYSSEY or HAWKER Aircraft Batteries

Model 25252-AA-S4: NOT FOR USE with GILL LT Series, ODYSSEY or HAWKER Aircraft Batteries

Contact VDC Electronics for any other resets needed



VDC Electronics, Inc.
147D Woodbury Road
Huntington, NY 11743 U.S.A.
www.batteryminders.com
techsupport@vdcelectronics.com

Outside of US & Canada, see page 35 for contact information

READ AND SAVE THESE INSTRUCTIONS

See Page 12 for Simplified Operating Instructions

Rev. F083010 VDC28252-AA-S3/S4-MNL

TABLE OF CONTENTS

Cautions and Features	4
Required Safety Instructions	6
Never Charge a Frozen Battery	7
Unit Location	7
DC Connection Precautions	7
A Spark Near the Battery May Cause Battery Explosion	8
Testing a Filler Cap Lead Acid Battery	9
Qualifying Your Battery	9 - 10
Specific Gravity – Capacity	10
Testing a Sealed, AGM, Lead Acid Battery	11
Use a Digital Voltmeter Only	11
Open Circuit No Load Voltage Table	11
Operating Instructions (Simplified)	12
Control and Indicators	13
Battery Connectors (Included & Optional)	14
Temp Sensor & A2GPU-2	15
Operating Instructions (Detailed)	16 - 18
Display (LCD) Error Code Table	17
Temperature Sensor ABS-2825 Instructions	19
LED Indicator Functions	20
Effects of Temperature on Battery Life	21
AGM and Flooded Charge & Float Voltages at Various Temperature Ranges	22
Troubleshooting	23
Detailed Specifications	24
AC Power Input Characteristics	25
Factory Preset Table	26 - 27
Power Supply Mode Selected Table	28

TABLE OF CONTENTS (con't.)

Safety and Protection Table	28
Electrical Cable and Physical Parameters	29
Desulfator Wave	30
Top View and Dimensions	31
LED Aviation Display Table	32
Your Notes	33
Repair or Replacement (US & Canada)	34
Repair or Replacement (Outside US & Canada)	35
Warranty	36

CAUTIONS: READ AND FULLY UNDERSTAND BEFORE OPERATING. Contact VDC Electronics if uncertain about any settings or operation.

BatteryMINDer® Charger / Power Supply / Desulfator / V-balancer
Switching mode with Microprocessor-controlled
Input: 100-240Vac / Output: 24Vdc 25Amp
User's Manual and Important Safety Information

Model: 28252-AA-S3/S4

FEATURES

Congratulations on purchasing VDC Electronic's new generation switching mode Battery Charger - Power Supply - HF Pulse-Type Desulfator.

This BatteryMINDer® comprises both patented technology and patent pending technology and incorporates the following features:

- High frequency switching mode = reduced weight, size and higher efficiency (>85%)
- Microprocessor controlled - ensures precise voltage, current and time related functions
- Auto universal AC input with Power Factor Correction (PFC) control - no manual switching = error free match to input power source world-wide
- High efficiency with low input current allow use of AC extension cable (up to 250'-16AWG)
- Aviation specific charging modes - ensures full compliance with major aviation battery manufacturer's specifications
- V-balancing mode provides individual battery voltage balancing (2 x 12-V battery connected in series) and battery internal cells balancing (US Patent Pending). **Requires VDC Authorized reset and additional Temp-Voltage Sensor.**
- Manual button select for power supply output (27.2V - S3, 26.1V - S4) @ 25A for "no battery drain" when powering avionics-electronics.
- Manual button select for high power Desulfation pulse output to prolong battery life- (USA Patented and Patent pending).

- LCD meter- display shows charging status and function settings.
- Displays charging current, voltage, charging time, charging AH, output power, battery temperature.
- Displays function settings: Power supply, Charge, Maintenance, Desulfation.
- Dip switch resets for different transition current and charging voltage levels.
- Detachable AC input cord receptacle for IEC world wide safety approved cord sets.
- 14’ DC output cable with Heavy duty Anderson connector.
- AC On / Off power switch Plug ‘n Run simplified operation.
- Dip switch setting for equalization mode.
- Output short circuit and reverse polarity protection.
- Internal over-heat protection.
- Severe battery plate sulfation diagnostics.
- Battery Charging temperature compensation (At the Battery).
- Battery thermal run-away protection (DI/Dt).
- Charging time management for each charging stage.
- RS232 interface connector provided for data communication with PC (Future Option Date TBD).
- Remote LCD display provided-(Future Option date TBD).
- Designed to UL/cUL, CE, FCC, EMC safety certification standards.

* Contact VDC Electronics Tech Support (techsupport@vdcelectronics.com) / 800-379-5579 (ET) for instructions on this subject

REQUIRED SAFETY INSTRUCTIONS
WARNING
TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TOPERSON, OBSERVE THE FOLLOWING:

- This unit is designed for protected use and should never be exposed to rain.
- Do not attempt to use the unit if it has been dropped or damaged.
- Never attempt to charge a damaged battery, frozen battery or non-rechargeable battery.
- Do not use the unit in a closed area or poorly-ventilated area.
- Never smoke, use an open flame, or create sparks near a battery or unit during charging operation as this may cause an explosion / explosive gas.
- Do not operate the unit if the cord or plug is damaged.
- Do not disassemble. VDC Electronics MUST be contacted for repair, replacement or analysis. Keep away from infants, children and pets.
- Switch off or remove AC power before connecting or disconnecting to battery.
- Refer to the battery Manufacturer's specific recommended values to determine if standard unit settings are correct. Contact VDC Electronics Tech Support before making any changes
- Check Battery Manufacturer's specific precautions - such as removing or not removing battery from aircraft before charging.
- Always remove battery from aircraft before equalizing or desulfating.
- Someone should be within range of your voice or close enough to come to your aid if working near a lead-acid battery.
- Wear protective goggles and turn your face away when connecting or disconnecting a battery.
- If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flush the eye with running cold water for at least 10 minutes and seek medical attention immediately.
- To reduce risk of damaging the Battery, avoid dropping any metal tools onto the battery.
- Never rest the Battery being charged on top of your Battery Charger.
- The Battery Charger / power supply should be kept as far away from the Battery as the output cables permit.
- When using the Temperature Sensor at any location other then on a battery the ring terminal must be insulated.

Always follow battery manufacturer's strict instructions for proper care, charging and testing of battery. Always use their FAA Approved "Instructions for Continued Airworthiness" (ICA). Questions relating to the subject should be referred directly to the battery manufacturer to be certain of current requirements that may have been added to or changed since publication of their instructions.

NEVER CHARGE A FROZEN BATTERY OR ONE AT A TEMPERATURE ABOVE 123° F.

PREPARING TO CHARGE

a. Always remove ground wire first.
b. Be sure area around battery is well ventilated while battery is being charged. Force gas vapors away by using a fan.
c. Clean battery terminals. Be careful to keep corrosion from contacting eyes.
d. Study all battery manufacturer's specific instructions such as recommended charge rates.
e. Determine condition of battery, by referring to instructions herein, before ever attempting to charge or desulfate any / all batteries.
f. Make sure unit is as far away from battery as output cables permit.
g. Never place unit directly above battery being charged; gases from battery will corrode and damage unit.
h. Do not operate unit in a closed-in area or restrict ventilation in any way.
i. Do not set battery on top of unit.

DC CONNECTION PRECAUTIONS

Note: Steps to be done in a well-ventilated area.

a. Connect and disconnect DC output clips from battery only after removing unit power cord from outlet.
b. Attach clips to battery posts and twist or rock back and forth several times to make good contact. This tends to keep clips from slipping off terminals and reduces risk of sparking.

UNIT LOCATION

A SPARK NEAR THE BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

a. Connect (RED) charger clip to (POS+) post of battery.

b. Position yourself and free end of cable as far away from battery as possible, then connect NEGATIVE (BLACK) charger clip to free end of cable.

c. Do not face battery when making final connections.

d. When disconnecting unit, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical. Do not attempt to permanently install unit not specifically designed-approved for permanent installation, especially in a wet high moisture environment.

QUALIFYING YOUR BATTERY:

Preliminary Requirements

NOTE: The BatteryMINDer has no electrical output unless it is connected to a healthy battery. Testing the BatteryMINDer with a volt or an Amp meter without the unit being connected across a good battery will result in a false reading. If you experience any problems, or are not sure of how to properly use or connect your BatteryMINDer, please e-mail our Tech Support Dept. at: techsupport@vdcelectronics.com or call our toll-free technical support line 800-379-5579 x206 (Eastern Time) (**USA & Canada ONLY**). Be certain to leave your <u>phone</u> <u>number</u> with the <u>area code</u>, <u>time zone</u> and the <u>best time to call</u>.

To gain the best result from your unit and to maximize the life and performance of your batteries we strongly recommend you qualify (test) your batteries before attempting to either charge-maintain or desulfate them. Remember, even if you just purchased a “new” battery it may have been subjected to conditions that have caused “sulfation” such as an extended period at high temperature (>=80°F).

NOTE: If your battery is new and you are certain it was not subject to conditions that could have caused sulfation*, even before you purchased it, then you can disregard our recommendations for qualifying / testing your battery, before using the BatteryMINDer.

* Such as high temperature storage (=/> 80°F) and/or allowed to self-discharge to 24.8 Volts or lower.

Testing a Filler Cap Lead Acid Battery

1. Carefully remove all filler caps from your battery.
2. Check the water-liquid electrolyte level. If the level is low or has ever been below top of plates, severe lead plate sulfation has taken place. Significant recharge/reconditioning time is needed to restore these plates to a condition where the battery can be expected to function normally.
3. Refill each cell with distilled water only to the liquid level indicator found in each cell. **Before proceeding further you**

must be thoroughly familiar with the safety and operating instructions.

4. Recharge the battery with the BatteryMINDer to ensure that it is slowly and completely charged before you determine its condition. Allow battery to “rest”* overnight or momentarily apply a small load to remove the “surface” charge which creates false voltage readings.

*** “RESTED” = a battery that has been as fully charged as possible, using a 4-stage charger (Model 28252-AA-S3/S4) and left disconnected from charger or any type load overnight. Apply a small load to remove surface charge effect.**

Specific Gravity – Capacity

Temp. Compensated Hydrometer - meter or 4 ball type	Full Capacity Percentage
1.285	100%
1.245	75%
1.210	50%
1.175	25%
1.140 May denote shorted cell or battery that has been severely discharged and may not be recoverable	0%

TABLE 1

TESTING A SEALED, AGM LEAD ACID BATTERY

These batteries have no filler caps or manifold-type covers. Because you cannot gain access to the interior of your battery you cannot test it with a hydrometer.

USE A DIGITAL VOLTMETER ONLY:

1. Recharge the battery with the BatteryMINDer to ensure it is as completely charged as possible, before you determine its condition. Allow battery to “rest” (see pg. 9) overnight before testing with a digital voltmeter only.

Failure to test a “rested” (see pg. 9) battery will cause false readings. Be certain to read and understand all safety related instructions (pages 3 to 7) before proceeding further.

2. Measure battery’s voltage, without any load attached. If the voltage is less than 25.2 volts (Typically 75% of charge) the battery may be too heavily sulfated to be fully recoverable. If voltage is 25.2-V or higher recovery can be expected, given sufficient time.

3. Press desulfation button to start process of dissolving sulfate crystals. **Ensure battery is removed from aircraft prior to desulfation.** Continue in this mode for 72 hours. Stop process by pressing desulfation button. Test battery voltage and compare to table 2 below. If voltage is not in the **full capacity** range restart the desulfation process and continue for an additional 72 hours before retesting. Continue repeating this procedure until no further increase in battery voltage is observed.

Note: Do not expect to completely dissolve sulfate in a day. Long established sulfate will require a longer period to be fully dissolved. Be patient and you will be rewarded with a “sulfate-free” battery. If not seriously damaged by sulfate, battery has a very good chance of meeting 80% Cap (Airworthy) Test.

OCV=Open Circuit No Load Voltage

TABLE 2

OCV - “Rested” Voltage	Full Capacity Percentage
25.8 - 26.2 Volts	100%
25.2 - 25.8 Volts	75%
24.8 - 25.2 Volts	50%
24.4 - 24.8 Volts	25%
24.0 - 24.4 Volts	0%
<22 Volts = shorted	

Simplified Operating Instructions

The BatteryMINDer has no electrical output unless it is connected to a battery with a minimum of 6-Volts.

- **Attach Temperature/Voltage Sensor ABS-2825 firmly to battery Positive terminal.**
- **Attach Battery Connector Attachments (BCA) to DC-CORD Output of unit.**
- **Plug AC Power Cord into 95 - 240 Vac electrical outlet. Turn AC POWER Switch On. Unit will automatically start in Charge Mode (expect up to a 10 second delay).**
- **Observe ERROR LED indicator. If lit RED, and LCD displays error code (E01), shut power off and reverse battery connector attachments on battery.**
- **Always power-off unit before disconnecting from battery(s).**

NOTES:

- If ambient temperatures are ≥80°F or ≤60°F, you MUST ALWAYS use Temperature/Voltage Sensor (on Positive + terminal of battery) to prevent improper charging.
- Unit automatically starts in charging mode.
- Press Power Supply button to operate as a power supply.
- Press Desulfation button to operate desulfation mode. **Ensure battery is removed from aircraft prior to desulfation.**

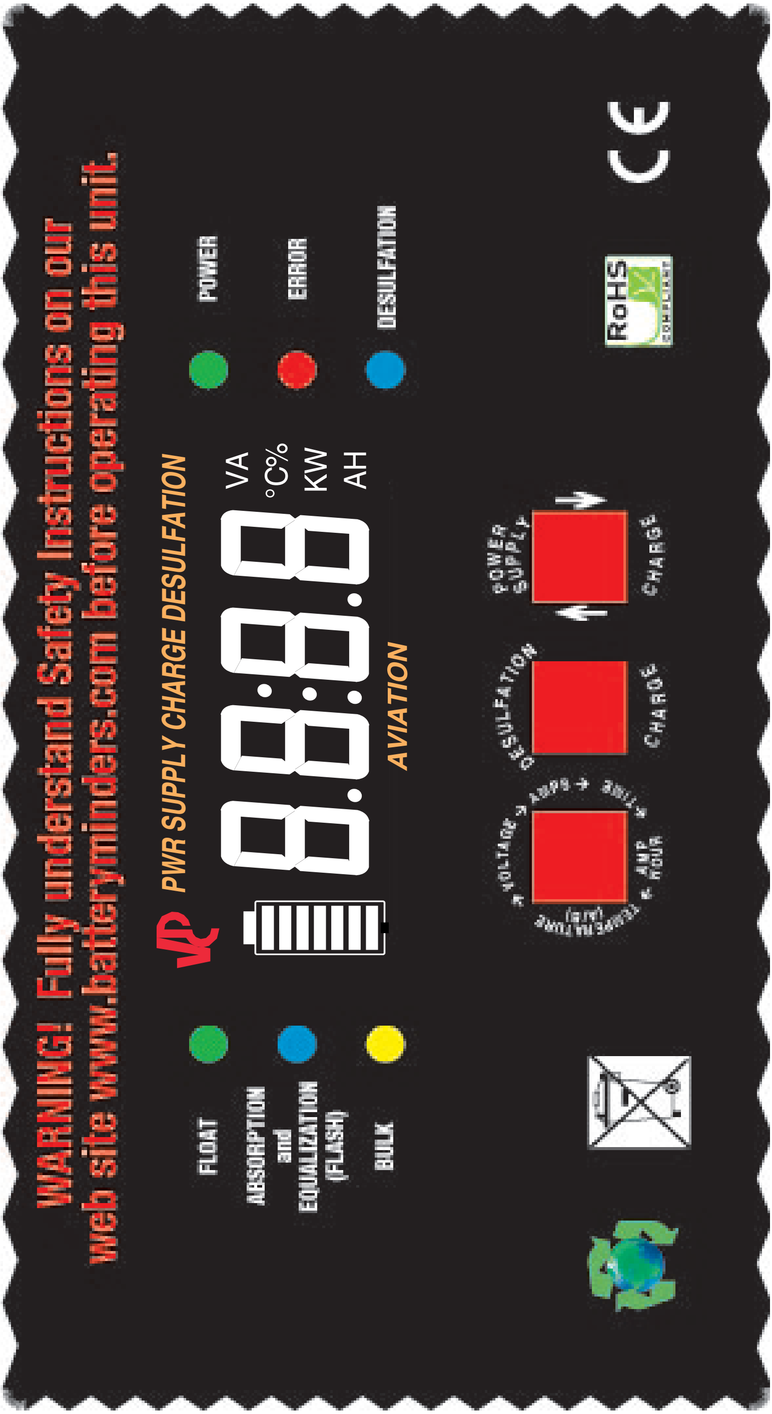
To Change the Mode on the Batteryminder 28252-AA-S3/S4:

- After the unit is powered on, if you do not press a Mode Button within 30 seconds, you will need to press the Mode Button TWICE.
- If the unit has not had a Mode changed within 30 seconds, you will need to press the Mode Button TWICE

In each instance, you only need to press the Mode Button ONCE if done within 30 seconds after the previous operation.

See additional information on this function on Page 19.

IF IN DOUBT REGARDING ANY OF THE ABOVE, REFER TO FULL INSTRUCTIONS


WARNING! Fully understand Safety Instructions on our web site www.batteryminders.com before operating this unit.
POWER
ERROR
DESULFATION
PWR SUPPLY CHARGE DESULFATION
VA
°C%
KW
AH
AVIATION
FLOAT
ABSORPTION and EQUALIZATION (FLASH)
BULK
POWER SUPPLY
CHARGE
DESULFATION
CHARGE
VOLTAGE
AMPS
TIME
AMP HOUR
TEMPERATURE
RoHS

Included & Optional Battery Connectors



BC 2410
Battery Clips
(included)



A2RT
11/32" Ring Terminals
(optional)



A2GPU-1
GPU Anderson
(optional)



A2GPU-2*
GPU Anderson with Relay Override
(optional)



ABS-2825
Temperature/Voltage Sensor (At-the-Battery Sensor)
(included)



A2ELCON
ELCON Type Connector
(optional)

*Must be used on aircraft where a relay needs to be activated in order to connect the battery and GPU.

When using the Temperature Sensor at any location (other then on a battery) the ring terminal must be insulated, heat shrink tubing is recommended. If using the A2GPU-1 or A2GPU-2 and are unable place the Temperature Sensor on a battery terminal it may be inserted into the unused cavity of the A2GPU plug and secured with cable clamp.

Instructions for A2GPU-2 plug

1. With unit turned off, connect A2GPU-2 cable assembly to the 28252-AA-S3/S4.
2. Have A2GPU-2 ready to connect to aircraft but DO NOT connect at this time.
3. Turn on 28252-AA-S3/S4.
4. Press and hold red button on plug while connecting to aircraft, keep button pressed.
5. Voltage will increase as indicated by the 28252-AA-S3/S4 display and you should hear the APU solenoid or relay activate.
6. Release button.

If relay fails to activate, replace the 9V A2GPU-2 battery.

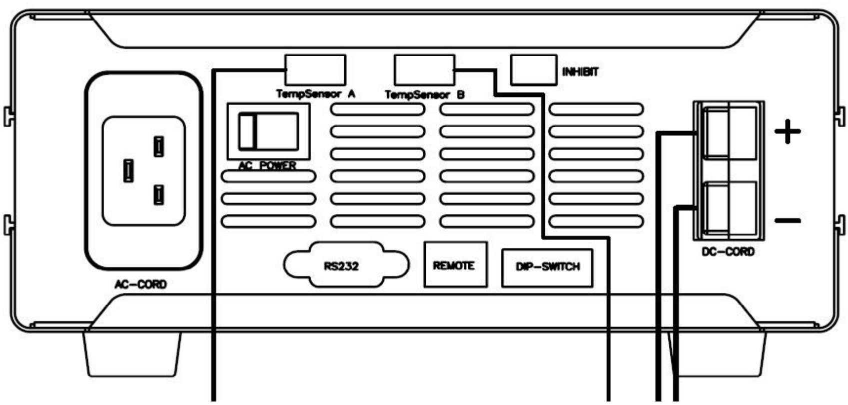
OPERATING INSTRUCTIONS

1. Pre-Charge Check

(a) Check the Battery Electrolyte level (Non-sealed Batteries). If necessary, remove the vent caps and add distilled water so levels are halfway between the upper and lower fill lines.

(b) Location – Ensure the Battery is in a well ventilated area. Keep the Unit as far away from Battery as the cables permit. Never place the unit directly above the battery being charged as gasses from the Battery will corrode and damage the unit. Also, keep the unit away from high corrosion / wet and moist areas.

2. Connecting BatteryMINDer to your Battery



(Temp/Volt Sensor A) are used to detect the battery voltage and temperature and to avoid undercharging or overcharging.

3. Aviation charge mode connection

(1). Connect to 24V Aviation battery.
(2). You MUST connect Temperature/Voltage Sensor ABS-2825 (no substitute) to the Positive (+) battery terminal.
(3). Connect the output DC cable RED clips to the battery Positive polarity (+), the BLACK clips to the battery Negative polarity (-).

4. Connect the unit to AC input power

Turn on the AC power switch.
Note: If the Error Indicator LED is ON and LCD displays E01, please check your connections as it's likely that the Positive and Negative Leads are reversed. Refer to the following Error code table and Troubleshooting Page for further information.

Display (LCD) Error code table:	
Output lead(s) shorted or battery reverse connected	E01
Soft-Start timed out	E02
Bulk charging timed out	E03
Battery severely sulfated or damaged	E04
Fan faulty	E05
Unit shuts down by internal over-temperature protection	E06
Battery Temp. >131°F/55°C; Resumes charge at <113°F/45°C	E07

NOTE:
- Unit automatically starts in charging mode.
- Press Power Supply button to operate as a power supply.
- Error codes are for Charging Mode only unless otherwise specified.

5. The Charging Process

The Charging LED's will indicate the Charging Stages. LCD will display the values and functional setting.

The charging stages are as follows:

- **Soft Start:** Charges the battery using half the maximum current until the battery voltage is over 22V (indicated by **YELLOW** Bulk LED FLASHING). Soft Start occurs if the initial voltage is less than 22V (due to severe-deep discharge)
- **Bulk Charge:** Charges using a constant maximum current until the battery rises to the Absorption level = 85% full (indicated by the **YELLOW** Bulk LED ON)
- **Absorption:** This stage charges the battery using a constant voltage providing that the Battery Voltage is over 85% (indicated by the YELLOW Absorption LED ON) .
- **Equalization**: Mode is only activated by calling VDC Electronics Technical Support at (800) 379-5579 x206. Do not use unless battery is removed from aircraft. Regular use of this mode may damage battery. Mode ensures full charge to ageing-marginal batteries and improves performance on capacity tests.
- **Float / Full:** Battery is in Float stage and fully charged, it will be maintained at a safe voltage and ready for use. (The GREEN Float LED ON - indicates the battery is fully charged).
- **Desulfation:** Mode is activated by pressing "Desulfation" button. **Do not use unless battery is removed from aircraft.** See Page 11.

6. Disconnecting BatteryMINDer from Battery.

(a) If the Battery is not in end-use installation:

1. Switch OFF AC power switch, remove the AC Power Socket from the outlet.
2. Remove the BLACK lead and then the RED lead, remove the Sensor A.
3. Check electrolyte levels if possible (may need topping up with distilled water after charging)

(b) If Battery is in end-use installation:

1. Switch OFF AC power switch, remove the AC Power Socket from the outlet.
2. Remove leads from battery. Remove Sensor A.
3. Check electrolyte levels if possible (may need topping up with distilled water after charging).

To Change the Mode on the BatteryMINDer 28252-AA-S3/S4:

- After the unit is powered on, if you do not press a Mode Button within 30 seconds, you will need to press the Mode Button TWICE
- If the unit has not had a Mode changed within 30 seconds, you will need to press the Mode Button TWICE

In each instance, you only need to press the Mode Button ONCE if done within 30 seconds after the previous operation

This is a safety feature to help prevent inadvertent operations, similar to an ATM asking you to confirm a transaction. If a Mode Button has not been pressed within 30 seconds, the button will be locked in the previous setting. Once you press the button again, the unit will be unlocked. This “double-press” feature goes into effect after approximately 30 seconds of not pressing any buttons.

INSTRUCTIONS:
TEMPERATURE SENSOR Type:
ABS-2825 (At-the-Battery Sensor)

MANDATORY WHEN UNIT IS USED WITH Sealed or Maintenance-type Aviation batteries, regardless of construction (AGM, Free-Electrolyte = filler caps)

Do NOT modify by extending or shortening the Sensor cord.

Attaching the temperature sensor to battery:

Connect it to the Positive (+) terminal post (clamp or screw) of the battery.

Unit is ON

Has Mode been changed **within 30 seconds**?

NO

Press Mode Button **TWICE**

YES

Press Mode Button **ONCE**



ABS-2825

LED INDICATOR FUNCTIONS		
AC power display LED		
AC Power LED On		AC power ON
Error LED		
RED Error LED ON or Flashing		See Troubleshooting section
Desulfation LED		
BLUE Desulfation LED Flashing		Unit is in Desulfation mode
Charging Status indicated LED		
Bulk LED	YELLOW Flashing	Indicates the battery is at low level and in soft start stage
Bulk LED	YELLOW On	Indicates the unit is at a maximum charging rate
Absorption LED	BLUE On	Indicates Battery is over 85% charged
Absorption LED	BLUE Flashing	Indicates automatic equalization stage is running
Float LED	GREEN On	Indicates battery is fully charged

Temperature has a direct effect on the life of a battery. The design life of the battery is based on an average annual temperature of 25°C (77°F). As the temperature increases above 25°C (77°F), the life of the battery decreases. The chart below shows the effects of temperature.

Effects of Temperature on Battery Life*		
Maximum Annual Average Battery Temperature	Maximum Battery Temperature	Percent Reduction in Battery Life
25°C (77°F)	50°C (122°F)	0%
30°C (86°F)	50°C (122°F)	30%
35°C (95°F)	50°C (122°F)	50%
40°C (104°F)	50°C (122°F)	66%
45°C (113°F)	50°C (122°F)	75%
50°C (122°F)	50°C (122°F)	83%
25°C (77°F)	50°C (122°F)	0%

For example: If a battery's design life is 10 years at 25°C (77°F), but the average battery temperature is 35°C (95°F), the life of the battery will be only 5 years a 50% decrease.

*GNB Industrial Power, A Division of Exide Technologies, Section 92.30 Part No. Z99-Mar/Sep I&O REV 10/01

The chart below shows the need to regulate the output voltage of the unit to ensure against over or under charging your battery over a wide range of temperatures. Using your At-the-Battery Sensor will accomplish this better than any other known method. Please note: Table is for the 28252-AA-S4. The 28252-AA-S3 is compensated to provide the proper voltages for GILL LT, ODYSSEY and HAWKER batteries with a charge voltage of 29.4V and float of 27.2V.

AGM and Flooded (wet-cell) Charge and Float Voltages at Various Temperature Ranges**			
Temp °F	**Optimum Charge**	**Optimum Float**	**Temp °C**
≥ 120	26.80	24.90	≥49
110 – 120	27.20	25.10	43 – 49
100 -110	27.40	25.30	38 – 43
90 – 100	27.60	25.50	32 – 38
80 – 90	27.80	25.70	27 – 32
70 – 80	**28.20****	**26.10****	**21 – 27**
60 – 70	28.50	26.60	16 - 21
50 – 60	28.80	27.00	10 - 16
40 – 50	29.20	27.40	4 - 10
≤ 40	29.80	27.80	≤4

** Values shown in **RED** are based on information supplied by Concorde Battery Co., effective 12-27-06. Values for batteries manufactured by other aviation battery companies are believed to be comparable. We **strongly** recommend checking with the appropriate dealer or battery manufacturer to be certain.

TROUBLE SHOOTING

Problems	Indication	Possible Causes	Suggested Solution
Unit does not work	Indicator LEDs are not on	No AC power	Check AC connections and make sure Power switch is ON
Unit has no DC output	Error LED is ON. LCD displays E01	Output is short circuited Output polarity connection to battery is reversed	Check DC connection between unit and battery and make sure they are not short-circuiting Check clips / ring terminals to be sure polarity is correct
No Charging Current	Error LED is Flashing and LCD displays E04	Battery is severely sulphated Battery has a damaged cell Battery aged	Check the Battery condition, age, etc. If battery cannot be desulphated, it must be replaced
Stop charging during charging progress	LCD displays E05 or E06	Battery charger internal over heat protection is activated-on, shutting down charging functions Fan faulty	Move battery & Unit to cooler environment Check the fan on unit
Long charging time, FLOAT LED does not come on	Fault LED is Flashing LCD displays E02, E03 or E04	Battery capacity is too large or battery is in very poor condition 6 hours soft start timer reached 15 hours bulk charge timer reached 12 hours absorption timer reached	Check charging rate, battery type and condition Battery cannot be charged and must be replaced
LCD displays Normal charge, but Error LED continuously Flashes	Error LED Flash, LCD meter displays normally	Sensor connections are faulty or loose	Check Sensor connections Ring terminal must be firmly fastened to the battery poles
Abnormal LED indication	ALL LED's continuously or intermittently Flash	Poor connections from Unit to Battery	Check for loose battery terminal connections Check output lead clips. May be loose / damaged

DETAILED SPECIFICATIONS (R12) -
VDC Model No. 28252-AA-S3/S4

24-V 25 Amp H.F. Battery Charger/ Desulfator/ Power supply

Program Code No.: 28252-R3

Battery Type: 24V Lead-acid Aviation Sealed or Flooded Battery

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

AC Power Input Characteristics	NORMAL	TOLERANCE	UNIT
Input Voltage	100-240	90-264	Vac
Input Frequency	50/60	47-63	Hz
Unload input current	100	max.	mAac
Input Current consumption at 120Vac 60Hz input, output 27V 25A loading	6.6	±10%	Aac
Nominal Efficiency at 120Vac 60Hz input, output 27V 25A	>85%		

Charging Output Control Characteristics

Charging Flow: Soft Start Charge→Bulk Charge→Absorption Charge→Equalizing Charge (Option)→ Float Charge (Full)
Power supply: Desulfation is not automatic (manual)

Aviation charge mode output control: Factory Presets (defaults)	NORMAL	TOLER-ANCE	UNIT
Soft start charging activity conditions:	Battery voltage is between 6-22	±2%	Vdc
Soft start charging output current control:	6.25	±10%	Adc
Soft start mode transits to bulk mode:	Battery voltage is above 22	±2%	Vdc
Soft start charging time limit: stops charging	6	±10%	Hours
Bulk charging condition:	Battery voltage is above 22	±2%	Vdc
Bulk charging current control:	25	±10%	Adc
Bulk mode transits to Absorption mode:	Battery voltage above 28.2[1]	±1%	Vdc
Max. Bulk Charging Time Limit: (Stops charging if time is exceeded)	15	±10%	Hours
Absorption charging activity:	Battery voltage above 28.2[1]	±1%	Vdc
Absorption charging output voltage control:	Battery voltage is constant at 28.2[1]	±1%	Vdc
Max. Absorption charging time:	12	±10%	Hours
Absorption charging transits to Equal charging conditions:			
1) When charging current drops to: 0.5		±10%	Adc
Or 2) Maintain charge until the current acceptance drops by less than 0.10 amp over a 1 hour period			
Max Equalizing Voltage:	30	±10%	Vdc
Max Equalizing Voltage:	1 ~ 8 (Subject to Bulk Charge time taken)	±10%	Adc

Aviation charge mode output control: Factory Presets (defaults)	NORMAL	TOLERANCE	UNIT
Max Equalizing Time:	4	±10%	Hours
Float charging output voltage control:	Battery voltage is maintained at 25.8 ~ 26.1[1]	±1%	Vdc
Max. Float charging current control	5	±10%	Adc
Restarts Bulk charging when battery voltage is low:	Battery voltage is below 25.2	±2%	Vdc
Battery temperature compensation activity conditions:			
Battery temperature compensation: value for battery voltage (based on value at 25°C)	Battery series -50mV/°C	±25%	mV/°C
Max. unloaded output voltage when disconnected from battery:	0.5	max.	Vdc
Max. output short-circuit current when disconnected from battery:	3	max.	mAdc
Max. flow back current (to unit) when connected to battery, AC power disconnected	3	max.	mAdc
Remarks:	[1] These voltages are for the 28252-AA-S4, the S3 Absorption voltage is 29.4V and float voltage is 27.2V.		
If Temperature - Voltage Sensor connection is faulty, detached or loose, unit will automatically run in Normal charge mode = NO TEMPERATURE COMPENSATION Repair or replace before using unit at temperature above 80°F or below 60°F			

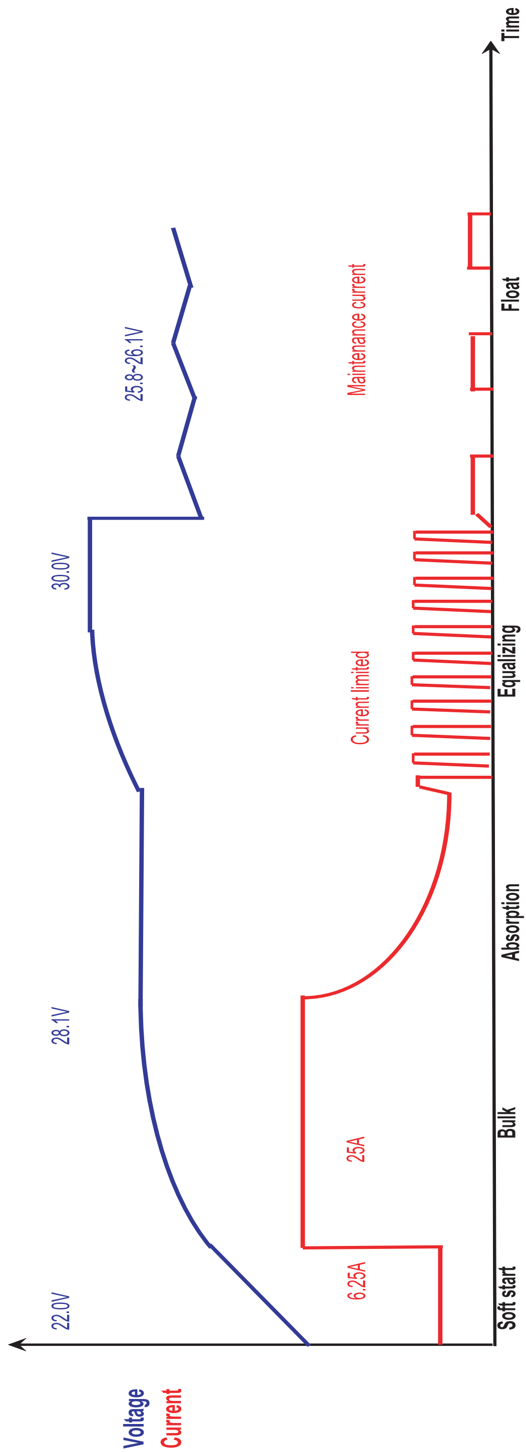
Power Supply (P.S.) mode selected	NORMAL	TOLERANCE	UNIT
Unload output voltage	26.1[1]	±0.2	Vdc
Max. current output	25	±2	Adc
Constant output voltage	26.1[1]	±0.2	Vdc
Desulfation mode selected	**NORMAL**	**TOLERANCE**	**UNIT**
Manual desulfation (Press button to start - stop)			
Desulfation output pulse peak current control Ip-p	20	+10 / -0	Adc
Desulfation output PWM frequency	1000.0	±10	Hz
Desulfation duty	0.10		%
[1] Voltage is for 28252-AA-S4; -S3 voltage = 27.2			

SAFETY & PROTECTION	
Safety Standards:	UL-1236, EN60335-1. EN60335-2-29
EMC Standards:	FCC-Part 15 Class B; EN55014
Input-Output insulation test :	3000Vac 50/60Hz with 1 minutes, 5mAac
Cooling:	By Fan forced air - Temperature Sensing
Built-in temperature protected	
Output short-circuit, reverse polarity Protection	

Electrical Cable & Physical Parameters			
Input Connector:		250V 15A IEC socket SJT VW-1 105°C 16AWG 3C with 3PIN UL plug, 6 feet external length.	
Input AC switch:		ON/OFF power switch	
Output Connector:		50A anderson connector	
		14’ long output cord with Anderson Plugs on both ends	
		12” long cord with 50A Anderson Plug and battery clips	
Steel Enclosure Dimension:		240 (L) x 215 (W) x 97 (H) mm / 9.45 x 8.46 x 3.8 in	
Operating Temperature:	-10°C/14°F to 40°C/104°F	Storage temperature:	-25°C/77°F to 85°C/185°F
Operating Humidity range:	0 to 90% RH	Weight:	3.5 Kg / 7.7 lbs. approx.

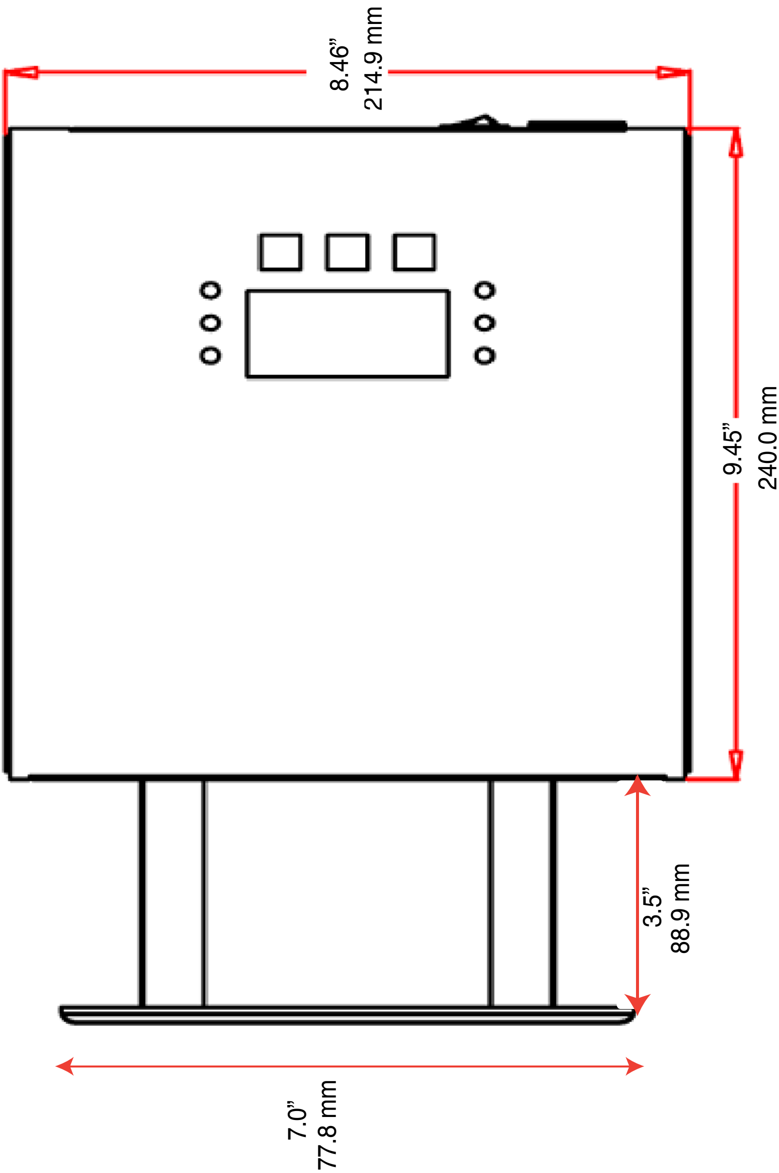
THDI<=5% (Total Harmonic Distortion of Current)
PowerFactor (PF) =0.98

CHARGING CURVE



Remarks: If power fails and then resumes, unit will automatically start from initial charging cycle.

BatteryMINDer 28252-AA-S3/S4 Top View and dimensions



LED AVIATION DISPLAY TABLE

	AC POWER	BULK	ABSORPTION	FLOAT	ERROR	DESULFATION
	GREEN	YELLOW	BLUE	GREEN	RED	BLUE
A.C. power connected, battery disconnected	ON	OFF	OFF	OFF	OFF	OFF
Soft start charging	ON	FLASH	OFF	OFF	OFF	OFF
Bulk charging	ON	ON	OFF	OFF	OFF	OFF
Absorption charging	ON	OFF	ON	OFF	OFF	OFF
Equalization charging	ON	OFF	FLASH	OFF	OFF	OFF
Float charging	ON	OFF	OFF	ON	OFF	OFF
Output clips shorted or battery polarity is reversed	ON	OFF	OFF	OFF	ON	OFF
Soft start charging 6 hours timed out	ON	OFF	OFF	OFF	FLASH	OFF
Bulk charging 15 hours timed out	ON	OFF	OFF	OFF	FLASH	OFF
Charger internal over-temperature protected	ON	OFF	OFF	OFF	FLASH	OFF
Manual desulfation	ON	OFF	OFF	OFF	OFF	FLASH
Power Supply mode	ON	OFF	OFF	OFF	OFF	OFF
Aviation charging mode selected	Display: Aviation on LCD					

YOUR NOTES:

FOR REPAIR OR REPLACEMENT

US and Canadian Residents

All returns must be authorized by VDC Electronics.

In the event that you believe your product may be defective, you MUST speak to a VDC Electronics technician at 1-800-379-5579 x206 (ET) before proceeding further.

If after speaking with our tech support personnel it is necessary to return the unit, you MUST request an RMA number.

Items must be returned within 10 days after receiving your **Return Merchandise Authorization** number and must be packed in the original packaging with manual and all connectors included. A **BatteryMINDer Returns Form,** which can be found at http://www.batteryminders.com/pdf/BatteryMINDer_returns.pdf, should also accompany your unit

Your Return Merchandise Authorization number must be shown on the return shipping label as follows:

VDC Electronics, Inc.
Returns Department
Attn.: RMA # (Enter Your RMA# Here)
147 D Woodbury Rd.
Huntington, NY 11743

Note: If your questions relate to safety concerns, please contact:
billwoods@vdcelectronics.com or if a potentially hazardous emergency may exist, cease using the product immediately and call
Bill Woods, 631-445-1064 (ET) or contact our Tech Support Dept., Monday – Friday at
800-379-5579 ext. 206.

Standard operating questions, clearly answered in this manual, will not be answered by phone.

FOR REPAIR OR REPLACEMENT (Outside US & Canada)
In the event that you believe your product may be defective, you MUST contact a VDC Electronics technician at techsupport@vdcelectronics.com. We will advise you on the best way to proceed. Please do not return your product to us without our authorization.

Note: If your questions relate to safety concerns, please contact:
billwoods@vdcelectronics.com or if a potentially hazardous emergency may exist, cease using the product immediately.

YOUR NOTES:

Warranty

5 Year Limited Warranty

VDC Electronics, Inc. warrants this product for FIVE years from date of purchase at retail against defective material or workmanship. It will be repaired or replaced at our option, at no charge, providing it is authorized by VDC Electronics and returned to a VDC Authorized Return Center with proof of purchase.

We make no warranty other than this limited warranty and expressly exclude any implied warranty including any warranty for consequential damages.

This limited warranty is not transferable.